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Inside this Issue

1 A Note from Headquarters

2 Cumulative Impacts Analysis for Mountaintop Coal Mining in Steep Slope Appalachia

3 Cape Wind Energy Project

5 Also of Interest

6 Humor from the Field

6 Newsletter Communication

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AQUATIC RESOURCES NEWS A REGULATORY NEWSLETTER

Headquarters, U.S. Army Corps of Engineers,
Regulatory Branch

A Note from Headquarters

Barring the first issue, this is the shortest newsletter we've published. It has been increasingly difficult for project managers to find the time to draft articles on a quarterly basis. Personnel changes have occurred at HQ and IWR, and there has been an increase in policy workload and ASA(CW) priorities. We have, in past issues, addressed many important topics such as functional assessment, watershed approaches, GIS and mitigation. At this time, we are going to take a hiatus on the Aquatic Resources Newsletter for a while. I hope that the past newsletters have provided helpful information for Corps project managers as we continue to implement and improve the Regulatory Program.

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Cumulative Impacts Analysis for Mountaintop Coal Mining in Steep Slope Appalachia

Katherine Trott

As the result of a court settlement agreement, the Corps, along with EPA, FWS, Department of the Interior Office of Surface Mining (OSM) and the West Virginia Department of Environmental Protection (WVDEP), issued a Draft Environmental Impact Statement in May, 2003. The purpose was "to consider developing agency policies, guidance and

coordinated agency decision-making processes to minimize, to the maximum extent practicable, the adverse environmental effects to waters of the U.S. and to fish and wildlife resources affected by mountaintop mining operations, and to environmental resources that could be affected by the size and location of spoil disposal sites in valley fills". It focused on steep-slope Appalachian surface coal mining and excess spoil disposal, although waters of the U.S. in other parts of the country are also filled by mining activities, including underground coal mining practices such as "face up" fills, waste rock fills and coal mine waste (see Volume 3, Issue 2 for discussions of some other types of mining affecting waters of the U.S.). This article discusses only the direct impacts to the aquatic resources portion of the cumulative impact study.

The study area is located within the Appalachian Coalfield Region of the Appalachian Plateau physiographic province and the Bituminous Coal Basin. (Figure 1) The rugged terrain is generally characterized by steep mountain slopes, confined river valleys and narrow ridge tops. Consistent with the EIS purpose, the study area boundary within this region was established to include watersheds where excess spoil fills, otherwise known as valley fills, have been constructed or are likely to be constructed in the future. The resulting study area boundary encompasses approximately 12 million acres and extends over portions of West Virginia, Virginia, Kentucky and Tennessee and is located within portions of nine ecological subregion sections. Within an ecological subregion section, geomorphology, lithology, soils, vegetation, fauna, climate, sur-

Distribution of Aquatic Resources News

The *Aquatic Resources News* will be distributed to field staff by e-mail. The Newsletter will also be available on the IWR website within the month at:

<http://www.iwr.usace.army.mil/iwr/regulatory/regulintro.htm>

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face water characteristics, disturbance regimes, land uses, and cultural ecology are generally similar.

The aquatic resources in the study area are generally classified through "stream ordering", a system based on size and position within the drainage network. The streams most affected by this type of mining are generally considered "headwaters" which usually include first through third order streams. They originate in high elevations and are comprised of coarser bed material such as boulders, cobble rubble and bedrock with large woody debris and overhanging riparian vegetation providing sources of organic material.

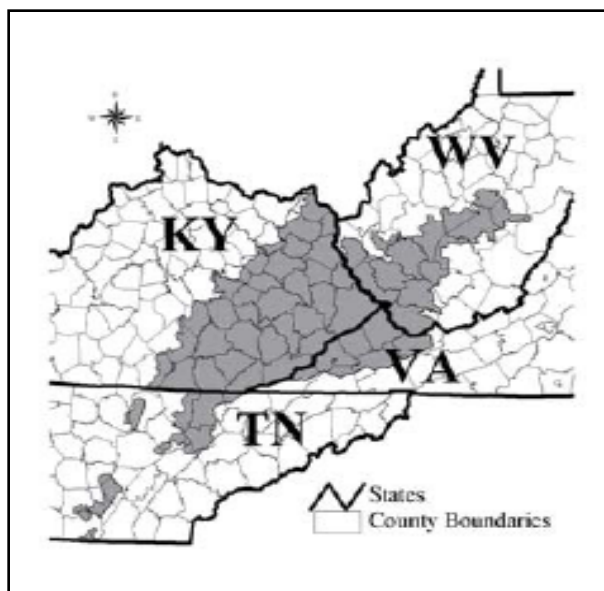


Figure 1. Study area.

A Landscape Scale Cumulative Impact Study evaluated the cumulative aquatic and terrestrial impacts of past, present and proposed future mountaintop mining by looking at all surface coal mining in or after 1992 in the study area. In an attempt to relate the project impacts to the cumulative impacts in the natural environment, the study further evaluated a portion of the study area (West Virginia) in greater detail using methods built upon a Landscape Assessment Approach developed by the Canaan Valley Institute and "landscape indicators" used to assess watershed conditions as described in the publication *An Ecological Assessment of the United States Mid-Atlantic Region: A Landscape Atlas* (USEPA Office of Research and Development, Washington DC, November, 1997). The detailed West Virginia-based study evaluated the future impacts based on permit data that was 60% complete.

The GIS stream network was generated from DEM data using standard ArcInfo commands. The streams were "synthetic" in that they were not generated by conversion of existing maps such as orthophotographs or USGS quad maps, into digital format. Instead, the streams were generated using a digital elevation model (DEM). A DEM is a digital representation of the earth's surface based on a regular series sample of elevation points organized into a 30x30 meter grid. DEM's can be used to model the direction of water flow and the accumulation of flow.

For the data used in the cumulative impact study, a contributing area of 30 acres was selected to generate a stream. There was some uncertainty in this selection given that permits in Kentucky have indicated perennial streams in watersheds smaller than 10 acres in size. Therefore, the synthetic stream network may underestimate stream length. The 30 acre size, however, was supported by USGS studies in West Virginia to determine in the field the ephemeral/intermittent and intermittent/perennial stream boundaries. The synthetic stream network was not ground-truthed.

Mine permit data layers were obtained from OSM. The goal was to compile GIS data layers for approved surface mining permits from the ten year time period from 1992-2002 within the four state study area. Mine permit polygons were based on maps submitted to the Surface Mining Control and Reclamation Act (SMCRA) authority by mine operators seeking to obtain a permit. The mine data set was compiled in such a fashion as to be as consistent as practicable among the states; however, there were differences in the available digital data sets. Data for the prior ten years were available in West Virginia, Virginia and Tennessee; only four years of data were available in Kentucky. Direct impacts of mine/fills to streams were calculated by converting all mine regions to polygons and overlaying them with the stream line data in a GIS. Length of impacted streams was calculated and percent of streams directly impacted was determined by dividing the impacted length by the total length of streams. Total stream length was calculated by using the permit area as the disturbance area.

The total stream length for the approximate 12 million acre study area is 58,998 miles. The order of streams found in the study area included first through sixth order streams. Identification of calculation by stream length by order was not performed in this study. However, a previous analysis calculated the percent of first through sixth order streams in the West Virginia portion of the study area. This prior identification and calculation of stream orders provides an indication that over half of the stream length in the study area are first or second order streams.

Based on permits in the last ten years and an assumption of a similar number and size of projects authorized in the next ten years, direct aquatic impacts to 1,208 miles of streams were estimated. Direct stream impacts were defined as the areas where the permit polygons overlapped the synthetic stream network. The direct stream impacts reflect the surface mining impacts including valley filling, backfilling and other surface mining impacts that would directly destroy a stream. Because the lengths of direct stream impacts were based on the permit area and not discrete valley fills, the length of stream may be overestimated. The percent of streams in the study area directly impacted by surface coal mining between 1992-2002 was estimated to be 2.05%. If the trend continues, by 2012, an estimated 4.1% of streams in the study area would be filled. However, it is not possible to take into account other factors affecting the rate of surface coal mining such as land ownership, access and economic factors.

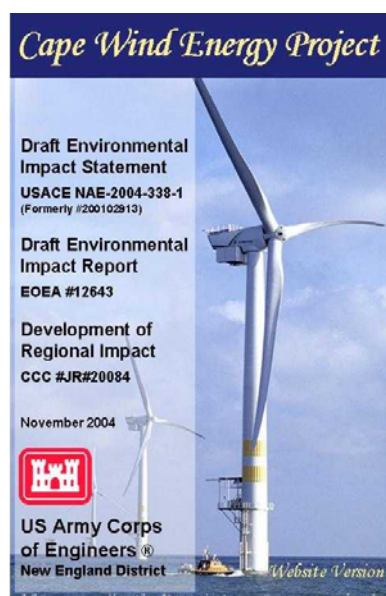
Headwater streams are known to be structurally complex, which may be negatively affected by several indirect effects of valley fills. Stream sections downstream of valley fills may be subjected to increased sedimentation from improper placement of sedi-

ment ponds, pond failure, or from post mining runoff. Sedimentation may also result from runoff due to areas being logged prior to mining. Sediment may fill pool areas and smother riffles and snags, decreasing the structural complexity of the streams. Other technical studies indicate that stream flow and temperature may be more constant below valley fills which, although not affecting the physical characteristics of the stream, may subtly decrease the availability of niches for some species.

(Katherine Trott is a senior project manager at Headquarters. She represents the Corps on the Steering Committee for the Mountaintop Mining/Valley Fill Programmatic EIS. This article is an excerpt from the cumulative impact section of the draft EIS.)

Cape Wind Energy Project

Karen Adams



The Draft Environmental Impact Statement (DEIS) for the proposed Cape Wind Associates, LLC Cape Wind Energy Project has been prepared by the New England District in response to a permit application to install 130 Wind Turbine Generators (WTGs) on Horseshoe Shoal in Nantucket Sound, Massachusetts. (Figure 1) The wind-generated electricity of approximately 454 MW will be transmitted via a 33 kV submarine transmission cable system to the Electric Service Platform (ESP) centrally located with-

in the WTG array. The ESP will then transform and transmit this electric power to the Cape Cod mainland via two 115-kilovolt (kV) alternating current (AC) submarine cable circuits. These submarine cable systems will make landfall in the Town of Yarmouth (Lewis Bay).

The project purpose is: *to provide a utility-scale renewable energy facility providing power to the New England grid.*

Renewable sources of energy are needed to provide additional power to meet demand and to reduce dependency on non-local, non-renewable energy sources.

The DEIS included discussion of cumulative impacts for construction, operation and decommissioning activities. In addition to the proposed project, other activities in the past, present or future that may contribute to cumulative impacts would include submarine cable or pipeline installations, dredging activities, trawling, instal-

lation of pile supported marine structures and other offshore wind power installations.

Impacts anticipated from the project and all these other marine activities that could occur in the vicinity of the project were evaluated with respect to: Geology and Sediment Conditions; Physical Oceanographic Conditions; Benthic and Shellfish Resources; Finfish Resources and Commercial/Recreational Fisheries; Protected Marine Species; Terrestrial Ecology; Wildlife and Protected Species; Avian Resources; Coastal and Freshwater Resources; Water Quality; Cultural and Recreational Resources and Visual Studies; Noise; Transportation and Navigation; Electric and Magnetic Fields; Telecommunications Systems; Air and Climate; and Socioeconomics.

A new submarine transmission cable, proposed by National Grid, involves the installation of a second electric transmission cable between Cape Cod and Nantucket. The proposed route would cross the Project's submarine cable route in the vicinity of Hyannis Harbor. The submarine cable installation for the Cape Wind Project would cross Nantucket Sound's North Channel. North Channel is a naturally occurring passageway marked by USCG aids-to-navigation but is not a Federal Navigation Project (FNP), and therefore is not subjected to maintenance dredging. There do exist submarine cables that cross from Falmouth to Martha's Vineyard and from Harwich to Nantucket. These submarine cables require routine maintenance. However, there are no significant cumulative impacts anticipated for any of the resource areas evaluated in the DEIS. The existing cables are approximately 13 miles (21 km) and 8 miles (13 km) away from the Project area, respectively. The minor disturbances to benthos, finfish, water quality and navigation, which can result from cable maintenance or installation are typically short-term and localized. Any impacts from these activities are not expected to occur within congruent resource areas.

At this time the only substantive offshore wind proposals are limited to a small-scale municipal (Hull) project south of Boston and a large proposal by Long Island Power Authority (LIPA) off Long Island, NY. Upland activities considered include cable or pipeline installations, excavation activities, construction of new commercial and residential structures and other upland wind power facilities. There are a few small community based wind power initiatives being considered as a result of the Massachusetts Technology Collaborative's Community Wind Collaborative.

The submarine cable system would be placed adjacent to the eastern edge of the FNP in Hyannis Harbor. Maintenance dredging of the channel, if initiated at the same time as the jet plow installation of the cable system, could result in additional concurrent, cumulative sediment suspension and deposition. Hyannis Harbor was dredged in 1985, 1991, and 1998. No dredging is currently scheduled, but based on recent experience it could be needed in the next 3-4 years. If the cable installation is completed in 2006 as expected, these activities will not be concurrent. Sediment deposition resulting from the cable installation would be minimal and localized, and would not substantially contribute to any notable cumulative impact.

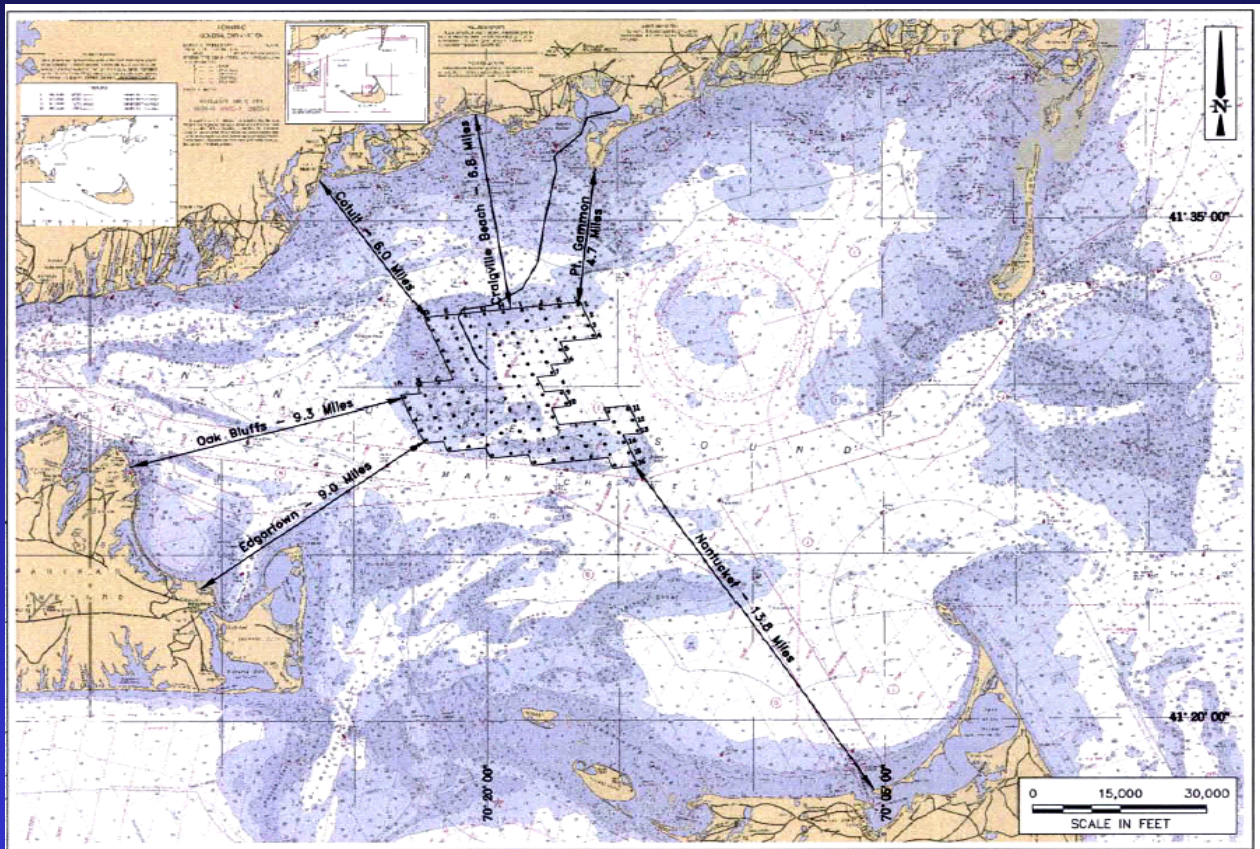


Figure 1. Study area.

The new submarine transmission cable proposed by National Grid between Cape Cod and Nantucket would cross the Project's submarine cable route in the vicinity of Hyannis Harbor. Prior to final design and construction, the applicants for both projects would need to coordinate plans, design, and schedule for installation of the cables at this crossing point. In locations where the two projects may be proximate, the impacts of each project may be coincident in nature. However, because sediment suspension and deposition impacts from jet plow cable embedment associated with the Project are minimal and of short duration, these temporary impacts are not likely to occur at the same time.

It is possible that additional dredging may occur at shore-based marinas supporting boating activities throughout the Project area. However, such marina dredging projects, if they were to occur, are very localized and would not likely result in sediment suspension and deposition that would be coincident with the cable installation (the closest point of which would be a minimum of 0.5 miles (805 meters) from the closest marina).

A wide range of natural (storms) and man induced (fishing/trawling, construction, anchoring, etc.) disturbances occur on a regular basis in these relatively shallow waters. While numerous anchor re-positionings would occur, the cumulative area is still small. The cumulative impacts associated with the project would not be anticipated to rise to a level above the normal background level of disturbance. The benthos and shellfish in the shallow waters of

Nantucket Sound are continually recovering from some form of recent disturbance and are well adapted to these conditions. Therefore, no significant cumulative impacts to resources are expected from construction of the WTGs, the inner-array cables, or the two submarine cable circuits. Impacts from construction activities are expected to be localized and temporary.

(Karen Adams is with the New England District in Concord, MA. She is the Chief of the Permits & Enforcement Branch for Massachusetts, but currently on Temporary Detail as the Project Manager of the Cape Wind EIS. Annmarie Harvie of the New England District Public Affairs Office contributed to this article.)

Also of Interest

Changes to HQ. We would like to welcome Dave Casey from the Alaska District who is working on the SPD-RIT and and Mike Jewell from the Sacramento District who is in the Regulatory CoP. Both will be working on national and regional issues. In addition, Martha Chieply has joined us to work with Chip Smith at the Assistant Secretary's Office on Regulatory and other issues. Jennifer Moyer is serving as the TEA-21 funded FHWA liaison at HQ while we recruit for and fill the position permanently.

(Katherine Trott)

Update on 87 Manual. The draft Alaska and Arid West supplements were evaluated at a recent National Advisory Team meeting in Salt Lake City. The National Advisory Team includes Jim Wakeley, Chris Noble and Bob Lichvar from ERDC, Katherine Trott from HQ, in addition to Steve Eggers (MVP), Dan Martel (SPN), Stu Santos (SAJ), Paul Minkin (NAE) and Jim Wood (SPA). The team also includes Ralph Tiner from FWS, Ralph Rogers and Ralph Spagnolo from EPA and Mike Whited and Jennifer McCarthy from NRCS. These draft documents must undergo independent peer reviews and field testing and will go out on public notice from the appropriate districts for public comment. Initial work will start on supplements for the Western Mountains and Valleys and the Great Plains this calendar year.
(Katherine Trott)

Mitigation Action Plan Update. The Federal Interagency Mitigation Action Plan (MAP) workgroup is completing work on several items and continuing to work on the remaining tasks. The status of MAP action items can be found at <http://www.mitigationactionplan.gov/actionitem.html>.

The MAP workgroup agencies solicited comments from their field staff on the draft buffer guidance earlier this year. Those comments have been incorporated and a final version will be distributed later this year. Work is continuing on the development of preservation guidance and guidance for applying a watershed perspective to compensatory mitigation. The MAP workgroup is also compiling and analyzing information that will be used in developing mitigation performance standards guidance. Field input will be critical in the development of mitigation performance standards guidance.

A number of recent evaluations of compensatory mitigation from a local and regional perspective can be found on the MAP web site at <http://www.mitigationactionplan.gov/recentevals.html>.

A MAP stakeholder forum was held in Tampa in September 2004. The purpose of the forum was to allow a broad range of stakeholders to comment on the MAP process and products in development. The forum report and copies of the presentations can be found at <http://www2.eli.org/research/wetlandsmitigationforum2004.htm>.
(Steve Martin, Norfolk District)

Hydrogeomorphic Wetland Profiling: An Approach to Landscape and Cumulative Impacts Analysis. EPA/620/R-05/001/ U.S. Environmental Protection Agency, Washington, DC by J. Bradley Johnson. 2005. This report presents Hydrogeomorphic Wetland Profiling (HGM WP), which is described as a practical approach to characterization of wetlands and their functions in landscape and cumulative impact analyses. For example, landscapes with high proportions of slope wetlands might be expected to perform functions such as groundwater discharge, carbon retention, and maintenance of base flows. HGM WP assumes that landscapes with similar physical attributes would have similar patterns of wetland abundance and diversity. Evaluation of changes in the abundance or diversity of HGM may enable quantification of impacts due to destruction, degradation, or alteration of functions. The study used landscapes in Summit County, Colorado to evaluate this approach. A copy of this report

can be downloaded at <http://www.epa.gov/owow/wetlands/monitor/>.
(Steve Martin, Norfolk District)

Ag MOA. On January 18, 2005, the Natural Resources Conservation Service withdrew from the 1994 Memorandum of Agreement, followed by the Department of the Army on January 24, 2005. As a replacement, the Corps and NRCS issued "Joint Guidance on Conducting Wetland Delineations for the Food Security Act of 1985 and Section 404 of the Clean Water Act" on February 25, 2005. This guidance addresses the responsibility of NRCS for performing wetland delineations for the Food Security Act and the Corps for delineations for Section 404 purposes. It encourages development of local partnerships between Corps Districts and NRCS state offices to provide timely and accurate wetland information to the public. Both agencies will inform property owners that their delineations are valid only for the Federal statutes for which each is responsible. It also states that the identification of prior-converted croplands (PC) made by NRCS remains valid as long as the area is devoted to an agricultural use. If the land changes to a non-agricultural use, the PC determination is no longer applicable and a new wetland determination is required for Clean Water Act purposes. Specific guidance will be provided by the Corps in the near future addressing how the Corps will treat PC designations for land that changes from agricultural to non-agricultural use. This guidance is currently in development by the Corps and EPA with help from NRCS and is planned to be completed in the next few months.

Humor from the Field

We encourage regulators in the field to submit humorous field experiences. The following was submitted from **Southwestern Colorado**.

A few weeks ago I spoke to a woman that was planning on developing a parcel of land in an alpine area and she knew that there were some wetlands on this parcel, so she called me up to discuss permit requirements. She asked me what are things we look for during our review and what situations would trigger a denial. Being that this question is asked to us daily, I gave the standard response that any Corps regulatory rep. can have in their sleep. However, due to the location of this project I warned her that if her proposed project would impact a fen, it would be extremely difficult to obtain a permit. Of course what then followed was my definition of a fen, which can be hard to define to a non-science oriented average citizen. So I tried my very best to describe a *histosol*, and I think I used the term mucky soil. I described how to texture out the soil and so on and so forth (I probably went too much into details but soil sometimes excites me) Anyway, knowing that I was losing her, I recommended that she contact a consultant.

Well today I get a call from a local consultant who tells me that his boss spoke to this developer regarding her parcel, and he wanted

to know what I meant when I told her to "watch out for monkey soils"... I was thoroughly confused but after recalling the conversation I had a great laugh. It made my Monday afternoon.

Thanks to Kara Hellige, Regulatory Branch, Durango Office, Sacramento District.

Newsletter Communication

To comment on the newsletter, suggest topics, submit an article, or suggest events or articles of interest, please contact Bob Brumbaugh at:

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